Deriving human risks and its significance for managers and regulatory toxicologists

Henryka Nagy

The use of exposure limits for monitoring and controlling chemical substances in the environment and in the workplace has always been the core of most occupational health guidelines and standards.

OSHA uses permissible exposure limits (PELs), the Association of Governmental Industrial Hygienists develops, threshold limit values (TLVs), NIOSH, establishes exposure limits (REL). EPA sets standards for toxic substances that contaminate the environment and FDA sets standards for food contaminants.

To justify a recommendation and regulatory measure these institutions determine whether the probability exists that a substance will produce harm under specific conditions.

In the past, the hazards have been commonly identified based on observations or reports of adverse health effects that occur in specific occupations. In many instances, workers had already died or became severely ill by the time any preventive pressures were installed. Ideally, hazards should be identified before agents are introduced into the workplace through the use of experimental tests that determine the potential toxicity.

The most convincing evidence of human risk can be derived from well conducted epidemiological studies in which positive associations between exposure and disease were observed. However, only in rare instances does sufficient human toxicity data exist to relate the exposure to the adverse outcome and define the threshold exposure for each population and each effect.

Human risk has to be extrapolated from experimental animal data. Animal studies are rarely designed to simulate the working environment. The experimental data have to be adjusted to the human condition. In extrapolating human risk from animal data, many assumptions are made. Although non carcinogenic chemicals are assumed to have an adverse effect which occurs only if exposure exceeds a threshold, it is uncertain whether carcinogens show threshold effects or whether the dose - response curve should be extrapolated linearly to zero.

Since risk assessments face many uncertainties, members of the public and experts might disagree about risk because they define risk differently. Social relationships of all types, including risk management, relay heavily on trust. The difficulty in verifying a risk analysis methods adds to the climate of distrust and present problem for risk mangers who design risk reduction strategies. In fact we tend to manage our risk within an adversarial legal system, contradicting each other's risk assessments and destroying the trust. The risk analysis methods or models and its results must be presented to the decision makers and other stakeholders in a manner that gives confidence in the validity of the models and assumptions, and presents the criteria used in deriving human risk assessments in a format that is transparent and easy to interpret.

- Effectiveness of Educational Intervention on Lead Workers at Different Times After the Program. *Roberto Lucchini, MD*, Italy. Coauthors: *Paola Materzanini, MD ; Marco Gelmi; Federick Zannol; Lorenzo Alessio, MD*
- Computer-based Hearing Screening Tests and Personalized Feedback. *Oi Saeng Hong, PhD, RN*, USA. Coauthors: *Delbert M. Raymond, MS, RN*; *Jamie Decker, BSN, RN*; *Julie Wilner*
- Examining the Impact of Narrative Case Studies in Toolbox Talks for Building Construction. *Terri Heidotting, EdD*, USA. Coauthors: *Carol Stephenson, PhD*; *Herb Linn*; *Paul Keane*

Risk Communication Strategies

Calhoun Room
Cabana Level, South

Moderator: *André Weel, MD, MOccH, PhD,* Netherlands

- Deriving Human Risks and Its Significance for Risk Managers and Regulatory Toxicologists. *Henryka U. Nagy, PhD*, USA
- A Study of the Risk Communication Needs of War Veterans. *Aaron Schneiderman, PhD, RN,* USA. Coauthors: *Barbara C. Curbow, PhD; Han K. Kang, DrPH*
- Health-e Voice: A Randomized Controlled Trial of Web-based Training to Improve Risk Communication Between Health Care Providers and Patients with Military-related Health Concerns. *Charles C. Engel, Jr., MD, MPH*, USA. Coauthors: *Terry J.W. Sjoberg, BSc*; *Ambereen Jaffer, MPH*; *Joyce Adkins, PhD*; *Tim Tinker, DrPH, MPH*; *Samar DeBakey, MD, MPH; David N. Cowan, PhD, MPH*
- VA Communication Program on Environmental Hazard Exposure in Military Service. *Donald J. Rosenblum, BS*, USA

Risk, Risk Perception, and Psychosocial Issues

Hopkins Room
Lower Lobby Level

Moderator: *Julie Hayes Seibert, MA, MPH,* USA

- Risk Perception- Psycho-Social Determinants-Inclusion in OSH Education. *Richard A. Lippin, MD, FACOEM*, USA
- Occupational Mental Health Issues in Light of September 11, 2001: Implications for Policy and Research. *Julie Hayes Seibert, MA, MPH,* USA. Coauthor: *Thomas R. Konrad, PhD*
- Homicide on the Job. *Charles Morgan, JD, CSP*, USA
- Violence at Work: Occupational Injuries and Fatalities in Mexico. *Jose Miguel Ramos, MD*, Mexico

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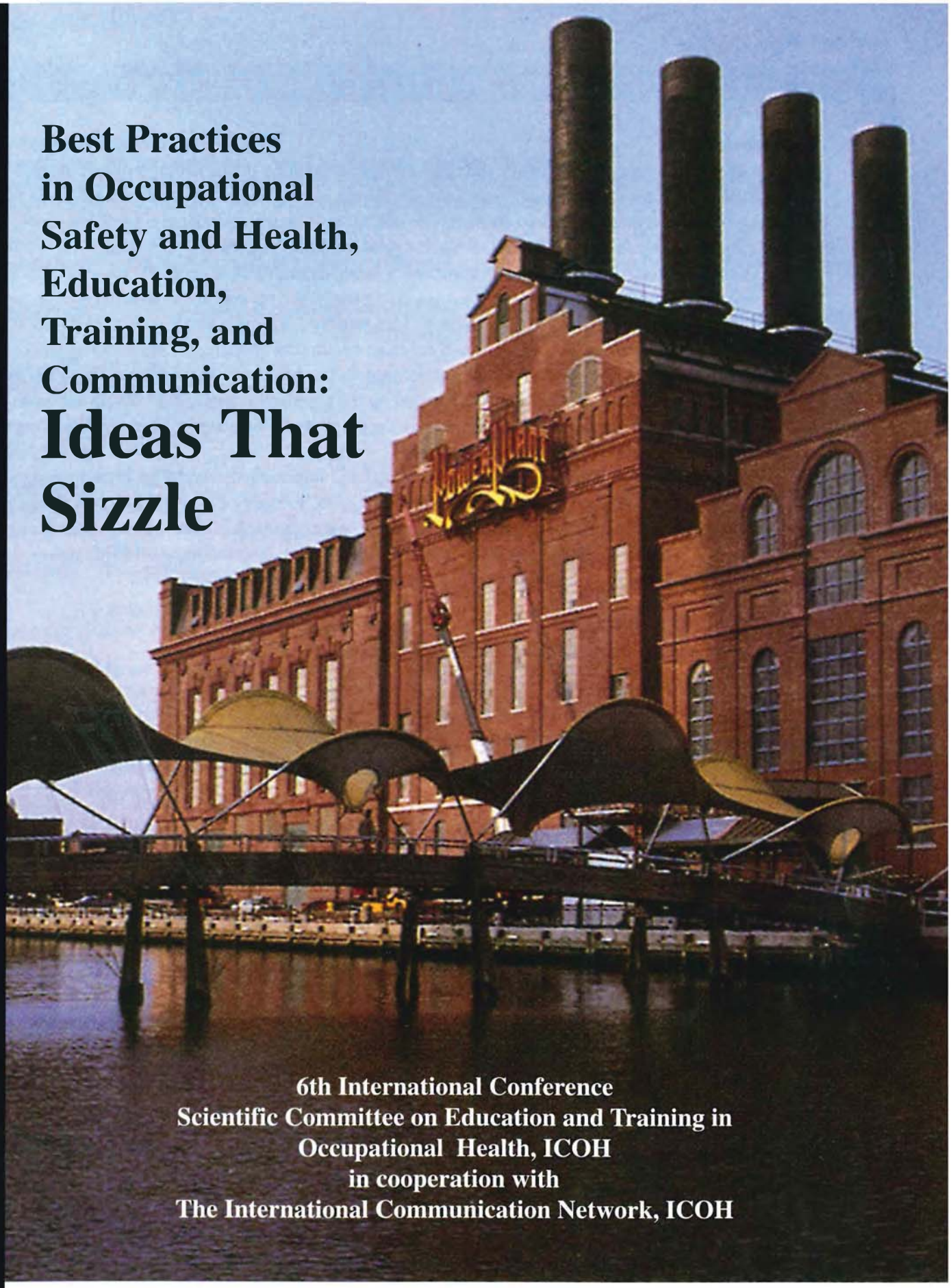

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